Space Weather Forecast

Issued on Tuesday, 30 August 2022 at 12:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further M-flares (R1-R2 Blackouts).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Moderate, with three Moderate flares, all from a large active sunspot region which is just beyond the southwest limb. There are two sunspot regions remaining on the disc, The most prominent of these, in the south centre disc, appears inactive, but has notable magnetic complexity. The remaining region is a weak, fading region. No Earth-directed coronal mass ejections (CMEs) are evident on available imagery. However a line of material (plasma) held above the Sun's surface by its magnetic field, called a filament, was observed erupting near the large region late on 29 August and will be analysed once sufficient imagery is available to determine if this has produced an Earth-directed CME.

Solar Wind / Geomagnetic Activity: The solar wind has been elevated through the last 24 hours, due to a likely combination of a CME arrival on 29 August and the influence of a fast solar wind. The speed has continued to increase through the early part of 30 August, reaching close to strong wind levels. Magnetic field strength initially varied between weak and moderate levels, but has steadily increased to sustained moderate levels during the last 12 hours. The north-south component of the magnetic field has generally varied weakly, but with one recent moderate peak. Geomagnetic activity was mainly Quiet to Unsettled, with one Active interval.

Energetic Particles / Solar Radiation: The count rather of energetic particles (high energy protons) has been below the S1/Minor radiation storm threshold.

Four-Day Space Weather Forecast Summary
Solar Activity: There is a chance of Moderate solar activity, initially from a sunspot region just over the southwest limb, and then from the relatively inactive, but magnetically complex region on the south-centre disc.

Solar Wind / Geomagnetic Activity: There are currently no Earth-directed CMEs, however a eruption from the south-centre disc will be analysed once further imagery becomes available. Solar winds are currently elevated due to a fast solar wind, but are expected to ease during days 3 and 4 (01 and 02 September). No further solar wind enhancements are forecast. Geomagnetic activity is currently expected to be mostly Quiet with isolated Unsettled spells. There is a slight chance of Active intervals and a very slight chance of G1/Minor storms on days 1 and 2 (30 and 31 August) due mainly to the solar wind enhancements in any periods of sustained negative Bz.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain below the Minor Radiation Storm level (S1). There remains a slight chance of further increases to or above the S1 level, from any significant flares from either of the large sunspots, including the one which has now rotated off the Earth-facing disc.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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